IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A dental caries detecting device, comprising:

an ultraviolet light source;

a fluorescence receiving portion that receives fluorescence from a tooth in response to ultraviolet irradiation of at least two different light intensities from the ultraviolet light source;

a fluorescence data analysis portion that analyzes fluorescence data transmitted from the fluorescence receiving portion; and

a data display portion that displays data analyzed by the fluorescence data analysis portion,

said fluorescence data analysis portion analyzing the fluorescence data based on fluorescence intensities in at least two wavelength bands in a visible light range, a first wavelength band of the at least two wavelength bands having a wavelength width from 10 nm to 260 nm, and a second wavelength band of the at least two wavelength bands having a wavelength width from 10 nm to 170 nm.

Claim 2 (Previously Presented): A dental caries detecting device, comprising:

an ultraviolet light source;

a fluorescence receiving portion that receives fluorescence from a single measuring area of a tooth in response to ultraviolet irradiation of at least two different light intensities from the ultraviolet light source;

a fluorescence data analysis portion that analyzes fluorescence data transmitted from the fluorescence receiving portion; and

a data display portion that displays data analyzed by the fluorescence data analysis portion,

wherein said fluorescence data analysis portion analyzes data based on a plurality of fluorescence intensities in at least one wavelength band that changes in response to change in the light intensity of said ultraviolet irradiation.

Claim 3 (Previously Presented): The dental caries detecting device according to claim 2, wherein said fluorescence data analysis portion calculates a degree of progress of dental caries based on said fluorescence intensity in a first wavelength band selected in a wavelength band from 550 nm to 810 nm and having a wavelength width from 0.1 nm to 260 nm, and said fluorescence intensity in a second wavelength band selected from a wavelength band from 380 nm to 550 nm and having a wavelength width from 0.1 nm to 170 nm.

Claim 4 (Previously Presented): The dental caries detecting device according to claim 2, wherein said fluorescence data analysis portion calculates a degree of progress of dental caries based on said fluorescence intensity in a first wavelength band selected from a wavelength band from 550 nm to 810 nm and having a wavelength width from 0.1 nm to 260 nm, and one or more of said fluorescence intensity in a second wavelength band selected from a wavelength band from 380 nm to 550 nm and having a wavelength width from 0.1 nm to 170 nm and said fluorescence intensity in a third wavelength band selected from a wavelength band from 450 nm to 650 nm and having a wavelength width from 0.1 nm to 200 nm.

Claim 5 (Previously Presented): The dental caries detecting device according to claim 4, wherein said fluorescence receiving portion comprises an optical device that can extract

information related to said fluorescence intensity in said first wavelength band and said second and/or third wavelength band from said visible light range.

Claim 6 (Original): The dental caries detecting device according to claim 5, wherein said optical device is one of a spectroscopic luminance meter, a color CCD, a CMOS, or an optical sensor with a color filter for at least two colors.

Claim 7 (Previously Presented): The dental caries detecting device according to claim 6, wherein an output intensity of said ultraviolet light source is adjustable.

Claim 8 (Original): The dental caries detecting device according to claim 7, wherein said ultraviolet light source is an ultraviolet LED.

Claim 9 (Currently Amended): A dental caries detecting method that ~~irradiates a measuring area of a tooth with ultraviolet light from a light source and~~ detects a dental caries based on fluorescence from [[the]] a measuring area of a tooth, comprising:

irradiating the measuring area of the tooth with ultraviolet light of at least two different light intensities from a light source;

obtaining fluorescence information from said measuring area;

obtaining an intensity of said fluorescence in at least two wavelength bands selected from a first wavelength band selected from a wavelength band from 550 nm to 810 nm and having a wavelength width from 10 nm to 260 nm, a second wavelength band selected from a wavelength band from 380 nm to 550 nm and having a wavelength width from 10 nm to 170 nm and a third wavelength band selected from a wavelength band from 450 nm to 650 nm

and having a wavelength width from 10 nm to 200 nm based on said obtained fluorescence information; and

carrying out calculation based on said fluorescence intensities and determining a presence/absence of dental caries and/or a degree of progress of dental caries based on a result of said calculation.

Claim 10 (Currently Amended): The dental caries detecting method according to claim 9, wherein said carrying out the calculation includes:

calculating a dental caries degree CD_1 based on the intensity R of fluorescence in said first wavelength band, and the intensity B of fluorescence in said second wavelength band or the intensity G of fluorescence in said third wavelength band according to the following formula (1) or (2):

$CD_1 = R/B$ ... formula (1)

$CD_1 = R/G$ ... formula (2)

comparing a value of said dental caries degree CD_1 and a lower threshold E_1, wherein the lower threshold E_1 is calculated based on predetermined fluorescence intensities of ~~a plurality of~~ at least one healthy ~~teeth~~ tooth when measuring conditions of the ultraviolet irradiation device and the fluorescence receiving device are determined; and

determining the presence of the dental caries if the value of said dental caries degree CD_1 is larger than said lower threshold E_1, and determining the tooth as being healthy if the value of said dental caries degree CD_1 is equal to or smaller than said lower threshold E_1.

Claim 11 (Previously Presented): The dental caries detecting method according to claim 10, further including:

comparing the value of said dental caries degree CD_1 and an upper threshold F_1 if the presence of the dental caries is determined; and

determining a presence of severe dental caries if the value of said dental caries degree CD_1 is larger than the upper threshold F_1 and determining a presence of minor dental caries if the value of said dental caries degree CD_1 is equal to or smaller than the upper threshold F_1.

Claim 12 (Currently Amended): A dental caries detecting method that ~~irradiates a measuring area of a tooth with ultraviolet light from a light source and~~ detects a dental caries based on fluorescence from [[the]] a measuring area of a tooth, comprising:

irradiating the measuring area of the tooth with ultraviolet light of at least two different light intensities from a light source;

when there are two said measuring areas, obtaining fluorescence from said measuring areas as first and second information;

obtaining fluorescence intensities in at least two wavelength bands selected from a first wavelength band selected from a wavelength band from 550 nm to 810 nm and having a wavelength width from 10 nm to 260 nm, a second wavelength band selected from a wavelength band from 380 nm to 550 nm and having a wavelength width from 10 nm to 170 nm, and a third wavelength band selected from a wavelength band from 450 nm to 650 nm and having a wavelength width from 10 nm to 200 nm based on said first and second information;

calculating a dental caries degree CD_2 based on said fluorescence intensities according to the following formula (3) or (4):

$CD_2 = |R_n - R_c| \times |B_n - B_c|$ ...formula (3) or

$CD_2 = |R_n - R_c| \times |G_n - G_c|$ ...formula (4)

where R_n is the fluorescence intensity in the first wavelength band in the first information, B_n is the fluorescence intensity in the second wavelength band in the first information, G_n is the fluorescence intensity in the third wavelength band in the first information, R_c is the fluorescence intensity in the first wavelength band in the second information, B_c is the fluorescence intensity in the second wavelength band in the second information, and G_c is the fluorescence intensity in the third wavelength band in the second information;

comparing the value of said dental caries degree CD_2 and a lower threshold E_2; and

determining a presence of dental caries if a value of said dental caries degree CD_2 is larger than the lower threshold E_2, and determining the tooth as being healthy if a value of said dental caries degree CD_2 is equal to or smaller than the lower threshold E_2.

Claim 13 (Previously Presented): The dental caries detecting method according to claim 12, further including:

comparing the value of said dental caries degree CD_2 and an upper threshold F_2 if the presence of dental caries is determined; and

determining the presence of severe dental caries if the value of said dental caries degree CD_2 is larger than said upper threshold F_2 and determining the presence of minor dental caries if the value of said dental caries degree CD_2 is equal to or smaller than said upper threshold F_2.

Claim 14 (Previously Presented): A dental caries detecting method, comprising:

irradiating a single measuring area of a tooth with ultraviolet light from a light source;

obtaining fluorescence from said single measuring area for at least two different light intensities of the ultraviolet light from the light source among light intensities U_1, U_2, ..., and U_n where $U_1 > U_2 ... > U_n$ as first, second, ..., and n-th information, respectively;

obtaining first fluorescence intensities R_1, B_1, and G_1, second fluorescence intensities R_2, B_2, and G_2, ..., and n-th fluorescence intensities R_n, B_n, and G_n of said fluorescence in at least two wavelength bands selected from a first wavelength band selected from a wavelength band from 550 nm to 810 nm and having a wavelength from 10 nm to 260 nm, a second wavelength band selected from a wavelength band from 380 nm to 550 nm and having a wavelength width from 10 nm to 170 nm, and a third wavelength band selected from a wavelength band from 450 nm to 650 nm and having a wavelength width from 10 nm to 200 nm based on said first information, the second information,..., and the n-th information;

carrying out calculation according to the following formula (5):

$(R_1 - R_2) + (R_2 - R_3) + ... + (R_{n-1} - R_n)$ ...formula (5)

and

determining that there is a possibility of dental caries if a sign of a result obtained from formula (5) is positive, and determining that the tooth is healthy if the sign is negative or a result is zero.

Claim 15 (Previously Presented): The dental caries detecting method according to claim 14, further including:

calculating a dental caries degree CD_3 according to the following formula (6) if it is determined that there is a possibility of dental caries,

$CD_3 = (R_{n-1}/R_n) \times (B_{n-1}/B_n)$ ...formula (6)

comparing a value of said dental caries degree CD_3 and an upper threshold F_3;

determining the tooth as being healthy if the value of said dental caries degree CD_3 is equal to or larger than said upper threshold F_3 and determining the presence of dental caries if the value of said dental caries degree CD_3 is smaller than said upper threshold F_3.

Claim 16 (Previously Presented): The dental caries detecting method according to claim 15, further including:

comparing the value of said dental caries degree CD_3 and a lower threshold E_3 if the presence of dental caries is determined; and

determining that the dental caries is minor if the value of said dental caries degree CD_3 is equal to or larger than said lower threshold E_3, and determining that the dental caries is severe if the value of said dental caries degree CD_3 is smaller than said lower threshold E_3.

Claim 17 (Previously Presented): The dental caries detecting method according to claim 14, further including:

calculating a dental caries degree CD_4 according to the following formula (7) if it is determined that there is a possibility of dental caries,

$CD_4 = (R_{n-1}/R_n) \times (G_{n-1}/G_n)$ ...formula (7)

comparing a value of said dental caries degree CD_4 and an upper threshold F_4; and

determining the tooth as being healthy if the value of said dental caries degree CD_4 is equal to or larger than said upper threshold F_4, and determining the presence of dental caries if the value of said dental caries degree CD_4 is smaller than said upper threshold F_4.

Claim 18 (Previously Presented): The dental caries detecting method according to claim 17, further including:

comparing the value of said dental caries degree CD_4 and a lower threshold E_4 if the presence of dental caries is determined; and

determining that the dental caries is minor if the value of said dental caries degree CD_4 is equal to or larger than said lower threshold E_4 and determining that the dental caries is severe if the value of said dental caries degree CD_4 is smaller than said lower threshold E_4.

Claim 19 (Previously Presented): The dental caries detecting method according to claim 14, further including:

calculating a dental caries degree CD_4 according to the following formula (8) if it is determined that there is a possibility of dental caries,

$$CD_5 = (R_{n-1}/R_n) \times \{(G_{n-1}/G_n) + (B_{n-1}/B_n)\} \quad \text{...formula (8)}$$

comparing a value of said dental caries degree CD_5 and an upper threshold F_5; and

determining the tooth as being healthy if the value of said dental caries degree CD_5 is equal to or larger than said upper threshold F_5, and determining the presence of dental caries if the value of said dental caries degree CD_5 is smaller than said upper threshold F_5.

Claim 20 (Previously Presented): The dental caries detecting method according to claim 19, further including:

comparing the value of said dental caries CD_5 and a lower threshold E_5 if the presence of dental caries is determined; and

determining that the dental caries is minor if the value of said dental caries CD_5 is equal to or larger than the lower threshold E_5 and determining that the dental caries is severe if the value of said dental caries degree CD_5 is smaller than said lower threshold E_5.

Claim 21 (Original): The dental caries detecting method according to any one of claims 14 to 20, wherein said n is 2.

Claim 22 (Previously Presented): A dental caries detecting computer readable medium including computer executable instructions, wherein the instructions, when executed by a processor, cause the processor to perform the dental caries detecting method according to any one of claims 9 to 20.

Claim 23 (Currently Amended): A dental caries detecting method that ~~irradiates a measuring area with ultraviolet light from a light source and~~ detects dental caries based on fluorescence from [[the]] a measuring area of a tooth, comprising:

irradiates the measuring area with ultraviolet light of at least two different light intensities from a light source;

obtaining fluorescence from said measuring area as first information, second information , ..., and n-th information for at least two different light intensities of the ultraviolet light from the light source U_1, U_2, ..., and U_n where $U_1 > U_2 ... > U_n$;

obtaining a first fluorescence intensity R_1, a second fluorescence intensity R_2, ..., and an n-th fluorescence intensity R_n in a first wavelength band selected from a wavelength band from 550 nm to 810 nm and having a wavelength width from 10 nm to 260 nm based on said first information, the second information,..., and the n-th information;

calculating according to the following formula (5):

$(R_1 - R_2) + (R_2 - R_3) + ... + (R_{n-1} - R_n)$ ...formula (5)

and

determining that there is a possibility of dental caries if a sign of a result obtained from formula (5) is positive, and determining that the tooth is healthy if the sign is negative or the result is zero.

Claim 24 (Previously Presented): The dental caries detecting device according to claim 1, wherein the fluorescence receiving portion includes a UV cut filter configured to block light of less than 400 nm.

Claim 25 (Previously Presented): The dental caries detecting device according to claim 2, wherein the fluorescence receiving portion includes a UV cut filter configured to block light of less than 400 nm.

Claim 26 (Previously Presented): The dental caries detecting method according to claim 9, wherein the obtaining the fluorescence information includes utilizing a UV cut filter to block light of less than 400 nm.

Claim 27 (Previously Presented): The dental caries detecting method according to claim 12, wherein the obtaining the fluorescence includes utilizing a UV cut filter to block light of less than 400 nm.

Claim 28 (Previously Presented): The dental caries detecting method according to claim 14, wherein the obtaining the fluorescence includes utilizing a UV cut filter to block light of less than 400 nm.

Claim 29 (Previously Presented): The dental caries detecting method according to claim 23, wherein the obtaining the fluorescence includes utilizing a UV cut filter to block light of less than 400 nm.